

Blue Ribbon Commission on America's Nuclear Future
Attn: Timothy A. Frazier, Designated Federal Officer
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Tim Frazier, BRC Commissioners & Staff: I applaud the effort invested in the draft report from the commission and the many useful thoughts and ideas it contains. I offer the attached suggestions in hope of contributing to the value of the final product in some small way. This is an important endeavor that will have significant consequences for management of spent nuclear fuel and high level radioactive wastes for years to come. Navigating the path between recommendations that are bland enough to support consensus, and detailed recommendations that make consensus challenging, is an art. I hope you lean towards more detail in your final report even if they require more artful negotiations. Without a detailed roadmap for progress, the nation will continue to be mired in repetitive studies that neither resolve the waste problem, nor the financial liability assigned to taxpayers through the judgment fund. Both issues beg for resolution, and options are available that both address these problems, and contribute to the nation's employment base in meaningful ways.

With that as a preface, here are my comments on the Draft Report from the Blue Ribbon Commission on America's Nuclear Future:

- Executive Summary; Page xvi: The second paragraph (first full bullet) lists a number of activities that should be undertaken to ensure the continued safety of at reactor storage of SNF. Full scale cask testing was the last recommendation. The NRC has continually asserted that existing certification practices for both transportation and storage casks are adequate to ensure safety. These practices include a combination of physical testing of scaled versions of the casks, computer modeling and incorporation of benchmarking data from infrequent full scale tests. Mandating expansion of full scale testing would not add to either safety or security, but would add considerably to the costs of certification programs. The BRC should strike this recommendation from the report, or modify it to be clear that full scale testing of each cask design is neither warranted nor desirable.
- Page xvi: The 7th paragraph (6th full bullet) recognizes that: "The current system of standards and regulations governing the transport of spent fuel and other nuclear materials has functioned well, and the safety record for past shipments of these types of materials is excellent." The recommendation goes on to say that transportation planning for these materials is complex and should commence at the very start of any consolidated interim storage project. This is a good recommendation, but doesn't go far enough. The transportation infrastructure that has been used for rail shipments is not acceptable for future shipments. All of the SNF in storage is packaged in a configuration that is too heavy to ship by legal weight truck. Most of this material will be shipped by rail, but the rail cars (cask cars, buffer cars and escort cars) required for future shipments have never been approved by the Association of American Railroads. A lengthy design, construction, and testing program leading to approval is required before these rail cars can be used. The basic recommendation to start this process as early as possible is good, but it missed half of the reasoning. It isn't just the complexity of

the transportation planning, but the complexity and lead time for acquiring the new hardware required that has to be taken into account.

- Section 3, Technical Background; Page 13: The first paragraph after the box insert describes high level waste. This paragraph suggests the long term risks associated with corrosion of the steel containers for HLW to be comparable to corrosion of the steel containers surrounding SNF. The form of the HLW (vitrified logs, cement or other forms) make it more, or less susceptible to migrating into the environment. That point should be made in conjunction with the discussion of the various forms HLW

can take. These differences can have a significant impact on the requirements for different disposal options being considered for HLW.

- Section 3, Technical Background; Page 14: This page describes the storage of spent nuclear fuel and then references a graphic that only shows the locations of operating reactors. A map showing the location of all independent spent fuel storage installations, ISFSIs, (at operating and shutdown nuclear plants) would be more germane to the discussion. The map in figure 9 (page 16) should be updated to show all ISFSI locations, not just operating reactor locations. The shutdown reactor sites should include the Fort St Vrain reactor site in Colorado even though DOE has taken over management of that site and the spent fuel stored there.
- Section 3, Technical Background; Page 17: The 1st paragraph in Section 3.3.2 suggests that SNF from research reactors is transferred to one of 3 larger sites for long-term storage. This should say one of 2 larger sites since the only 2 sites where DOE is still transferring SNF are the Savannah River Site and Idaho National Laboratory.
- Section 3, Technical Background; Page 18: The second paragraph suggests that DOE has liquid high level wastes at Hanford, Idaho National Laboratory and at the Savannah River Site. All of the liquid high level waste at INL has been converted to a calcined granular solid. No liquid HLW is now stored at INL. The statement needs to be changed to reflect that liquid HLW was once stored there, but has all been converted to a solid form. Conversion efforts are still underway at Hanford and SRS, so the statement regarding liquid HLW is accurate for those sites.
- Section 4, Geologic Disposal; Page 31: The second paragraph in Section 4.2 states that direct disposal of HLW without interim storage at another location should be pursued. Given the enforceable agreements for removal of HLW from the States of Washington, Idaho and South Carolina, and the decades long delay to development of a repository caused by the dismantlement of the Yucca Mountain Program (see GAO-11-229, April 2011), consolidating HLW storage at another site may be a wise move economically. The financial penalties at INL alone are \$60,000/day if the HLW is not removed on schedule. We recommend including consolidation of HLW as an option if it contributes to an economically balanced approach to managing the back-end of the fuel cycle.
- Section 5, Storage & Transport; Page 40: Footnote “c” to Table 1 is out of date – NAC’s MAGNASTOR® dry storage cask technology was selected by ZionSolutions, a subsidiary of EnergySolutions, for use at Zion (i.e., not the “FuelSolutions W21” systems).
- Section 5, Storage & Transport; Page 43: This page enumerates the ways in which a consolidated storage facility would benefit repository development. One of the benefits not mentioned is the development of a viable transportation system for spent nuclear fuel. There are requirements for new and specialized rail cars for the spent fuel, for the escorts that travel with the spent fuel, and for the buffer cars that provide spacing in the train. All of these rail cars have to be designed, manufactured, tested and approved to meet the Association of American Railroads’ Standard S-2043. No rail car has ever made it through this process. This testing and approval is not only necessary for the individual cars, but for the entire consist (the whole train). Completing this process for the first time will be technically challenging and first time schedules are unpredictable. In addition, the NWPAs requires the federal government to provide training for emergency responders and technical support to corridor states along the transportation corridors. The implementation details for this requirement have not

been worked out and agreed to by the states. Developing consolidated storage in advance of a repository would allow these issues to be resolved in advance of repository operations, making the repository schedule more reliable.

- Section 5, Storage & Transport; Page 43: Section 5.2.5 discusses the technical benefits of consolidated storage. The BRC has also recommended an expanded RD&D program to explore the implications of very long-term storage of SNF. That research mission is not compatible with continued storage of SNF at reactor sites. Incorporating RD&D into initial consolidated storage facility design would be relatively easy by comparison. This would also benefit a repository because of the lengthy storage of fuel on aging pads to

- meet the heat load restrictions for disposal drifts. This section suggests the RD&D mission would only be advanced with a hot cell, but other research activities could effectively be implemented at a consolidated storage facility even without a hot cell, or a spent fuel pool for wet transfer operations. Recommending that the facility needs for effective research into cask monitoring and other non-intrusive research be considered along with development of a CIS would provide a cost effective way to meet RD&D goals and community expectations for more than storage jobs.
- Section 5, Storage & Transport; Page 53: Section 5.6 covers Transportation Issues. This section repeats the conclusion from a 2005 NAS Study that there are “no fundamental technical barriers” to transporting these materials safely. The past success with these shipments is not a guarantee of future success, but the report only identifies changes in the scope of future shipments and institutional challenges as major hurdles. The report fails to recognize that the physical infrastructure used to make these shipments in the past is not acceptable for future shipments. Rail cars using new technology and with enhanced dynamic performance and real time performance monitoring are required for future shipments. The requirements for these rail cars are defined by the association of American Railroads’ Standard S-2043. Rail cars meeting this standard have never been designed, fabricated, tested and approved. This is a significant hurdle for future transportation campaigns and is an important reason for developing approved hardware in parallel with addressing the institutional issues that are covered in this report. The cost of this transportation infrastructure will exceed the cost of an interim storage facility for the shutdown reactor sites and will take at least as long to develop. Any hope for maintaining future repository operations schedules will rely on early development and approval of the transportation hardware along with addressing the institutional issues with corridor states and tribes. The report needs to be amended to recognize the need for early development of the hardware in addition to addressing the institutional issues.
- Section 6, Consent Based Siting; Page 60: In the first paragraph, two sites (Eurajoki and Loviisa) are described as technically suitable for a repository in Finland. The paragraph goes on to say that of the two sites, more nuclear infrastructure already existed at Olkiluoto. It isn’t clear which of the two sites already mentioned is associated with Olkiluoto. Some connection needs to be established.
- Section 6, Consent Based Siting; Page 60: The fourth paragraph, first sentence is missing the word “fuel”. The sentence addresses efforts in Sweden to develop: “... a geologic repository for spent nuclear with...”. The word fuel is needed after “spent nuclear” and before the word “with”.
- Section 7, New Organization; Page 75: This is the section that discusses the benefits of a federal corporation chartered by Congress and suggests this is the preferred structure for a new waste management organization. One of the benefits mentioned is that this type of organization will “be less susceptible to political micromanagement.” The third paragraph goes on to recommend that this federal corporation have a Board of Directors (BOD) that is appointed by the president and confirmed by the Senate for staggered 6 year terms. This process is only marginally different than the current federal agency approach where the Director of the Office of Civilian Radioactive Waste Management was nominated by the president and confirmed by the Senate. The BOD for AMTRAK (another federally chartered corporation) is composed of 9 individuals nominated by the President and confirmed by Congress with staggered terms of service. AMTRAK is still an organization that struggles with politics and its BOD is often composed of individuals with little or no railroad background. Even the NRC has struggled recently with political influence over the ranks of its Commissioners (again, appointed by the president and confirmed by the Senate). To truly minimize political influence, the federal charter needs to call for the majority of the BOD to be selected by the key stakeholders, not

the administration. The key stakeholders are either the utilities that hold contracts with the government for management of spent fuel, or the regulated utility commissioners that represent ratepayers that have paid into the Nuclear Waste Fund. These are the groups that are focused on a solution to the problem, not politics. These are also the groups most likely to appoint knowledgeable professionals to guide the corporation to success. A BOD dominated by representatives of the key stakeholders would also be more likely to select an effective CEO to guide day-to-day operations of the corporation. If the nomination of board members will remain with the President, a majority of the nominations should be from a list of approved candidates submitted by the key stakeholders, similar to the proposal for selecting members of the Nuclear Waste Technical Review Board described on page 78.

- Section 7, New Organization; Page 77: The second paragraph recommends that the new organization report to Congress on its activities, expenditures, and progress. The requirement to submit a baseline plan should be added to these expectations. Reports on progress and expenditures don't mean much unless there is a baseline to compare those reports to. Some standard is needed to compare progress against to see if costs and progress are meeting expectations or not. The baseline plan provides that yardstick.
- Section 7, New Organization; Page 78: In Section 7.4.3, the first paragraph suggests that regulatory authority for shipments of SNF reside with DOT. DOE has long held the position that transportation of SNF under the NWPA could be conducted in accordance with DOE's own authority under the Atomic Energy Act, and DOT would have no jurisdiction. The phrase used in presentations to stakeholders was that DOE would "meet or exceed" the requirements of DOT, but would not be under DOT purview. This created great mistrust among many stakeholders and was universally objected to by the four State Regional Groups DOE interfaced with. Any new organization needs to clearly be placed under DOT and NRC regulations for all aspects of transportation just as any commercial shipment of SNF is regulated. The NAS indicated that these shipments could be conducted safely if performed within the constraints of, and in compliance with, current regulations. Rebuilding trust with stakeholders will require the use of established authorities for regulation of the shipments. The report should recommend that the shipments be conducted under DOT and NRC purview, not just structured to meet or exceed those requirements.
- Section 8, Funding; Page 90: The discussion and the graphic show the disconnect between funds requested for managing spent nuclear fuel and funds appropriated for that purpose. The true disconnect is larger than depicted. The president's budget request is a negotiated number that balanced competing priorities and does not fully support the needs of a waste management program independent of other projects and programs funded by tax dollars. In March of 2007, the Director of OCRWM submitted a "Best Achievable Schedule" to Congress that showed the annual expenditures needed to achieve repository operations by 2017. The budget profile for that schedule was significantly in excess of the administration's requests in 2008, 2009 and 2010. Any discussion of the disconnect in funding should look at the funds requested in the "Best Achievable Schedule" submitted by OCRWM Director Ward Sproat in March of 2007, not the more restrained funding requests from the administration.
- Section 8, Funding; Page 94: Paragraph 4 provides a discussion of DOE's estimates of the liability associated with its partial breach of contracts to accept and manage spent fuel. One element that could increase the cost of settlements is mentioned, but other factors can also have large impacts on the settlement costs. A recent appeals court decision in favor of Southern California Edison allowed for inclusion of overhead costs in the damages. This amounted to an additional \$24M for SoCal Edison for the period being considered. This appeals court decision may affect eventual judgments for the 21 other cases on appeal, and may further increase the federal liability.

- Section 9, Regulatory Issues Page 96: Under the discussion of regulatory authority the first paragraph reasserts the authority of DOT over SNF shipments made by DOE. DOE has consistently asserted that it will meet or exceed DOT requirements, but DOT has no direct authority because DOE can self-regulate under its Atomic Energy Act authority. This is a disconnect that needs to be resolved in any future legislative changes so the framework for regulation is clearly understood. External regulation by DOT and NRC for their respective areas of transportation oversight should be included as a requirement in any legislative charter for a new management organization. This is an essential element for rebuilding trust with key stakeholders. DOT and NRC regulation in this area will preserve a predictable regulatory environment with a clear basis for public involvement in transportation planning.
- Section 12, Near Term Actions; Page 134: The second bullet encourages DOE to pursue standardization of dry cask designs. This may not be viable given the diversity of designs already deployed. A more important requirement would be emphasis on designs that reduce the cost of dry storage. When a repository is selected, and the basic science and preliminary design are complete, it may be possible to specify a standard design that provides an overall system saving, much like the Transport, Aging and Disposal (TAD) canister systems that were developed pursuant to specifications compatible with Yucca Mountain. Driving for standardization before the endpoint requirements are defined will not be productive or economic. Whatever directions are taken with waste management in the future, a lengthy period of dry storage will be included. That stage of spent fuel management should be as efficient as practicable.
- Section 12, Near Term Actions; Page 134: The first bullet under the Transportation heading recommends that DOE: "...complete the development of procedures and regulations for providing technical assistance and funds (pursuant to section 180 (c) of the NWPA) for training local and tribal officials in areas traversed by spent fuel shipments...". This recommendation should be expanded to include the pilot projects using dry runs with empty SNF transport casks that were the cornerstone of finalizing the 180(c) process in the last Federal Register notice published by DOE. This collaborative approach to developing a working process had the strong support of stakeholder groups and no change in the approach should be pursued without stakeholder agreement.